

What is claimed is:

1 1. An apparatus for manufacturing at least one biochip
2 from at least one substrate comprising:

3 a conveying device for moving the substrate through a
4 series of receiving positions; and

5 a series of dispensers positioned at a series of
6 dispensing positions relative to the series of receiving
7 positions of the conveying device, wherein each of the
8 dispensers has a plurality of nozzles, and each of the nozzles
9 dispenses a predetermined reagent at a predetermined position
10 of the substrate;

11 wherein each dispenser in the series of dispensers
12 dispenses an array of reagents onto the substrate when the
13 substrate is positioned in the corresponding receiving
14 position.

1 2. The apparatus as claimed in claim 1, wherein the
2 dispensers are separated by a predetermined distance along
3 a first axis defined by the motion of the substrate, and the
4 conveying device moves the substrate the predetermined
5 distance in a step-by-step manner.

1 3. The apparatus as claimed in claim 2, wherein the
2 series of dispensers are aligned such that the reagents,
3 dispensing from different dispensers, do not overlap.

1 4. The apparatus as claimed in claim 3, wherein the
2 conveying device comprises:
3 a base for receiving and supporting the substrate ; and
4 a plurality of transferring devices, disposed at the
5 base, for moving the substrate from one of the series of
6 dispensing positions to the next in the series of dispensing
7 positions.

1 5. The apparatus as claimed in claim 4, wherein the
2 conveying device further comprises:

3 a plurality of positioning devices, disposed on the base,
4 corresponding to the series of dispensing positions; and

5 a plurality of retainers, disposed on the base,
6 corresponding to the plurality of positioning devices;

7 wherein each of the positioning devices pushes the
8 substrate into a predetermined position corresponding to
9 dispensing position and the retainers hold the substrate in
10 the predetermined position.

1 6. The apparatus as claimed in claim 5, wherein the base
2 is provided with a slot, and each of the transferring devices
3 comprises:

4 a cam rotatably disposed at the base; and

5 a rod extending through the slot for moving the substrate,
6 wherein the rod is connected to the cam at one end, and abuts
7 the substrate at the other end, wherein the rod moves the
8 substrate by the rotation of the cam.

1 7. The apparatus as claimed in claim 3, wherein the
2 conveying device comprises:

3 a plurality of fixtures for receiving and supporting the
4 substrate;

5 a base for disposing the fixtures thereupon; and

6 a plurality of transferring devices, disposed at the
7 base, for moving the fixture from one of the series of
8 dispensing positions to the next in the series of dispensing
9 positions.

1 8. The apparatus as claimed in claim 7, wherein the
2 conveying device further comprises:

3 a plurality of positioning devices, disposed on the base,

4 corresponding to the series of dispensing positions; and
5 a plurality of retainers, disposed on the base,
6 corresponding to the plurality of positioning devices;
7 wherein each of the positioning devices pushes the
8 fixture into a predetermined position corresponding to
9 dispensing position and the retainers hold the fixture in the
10 predetermined position.

1 9. The apparatus as claimed in claim 8, wherein the base
2 is provided with a slot, and each of the transferring devices
3 comprises:

4 a cam rotatably disposed at the base; and
5 a rod extending through the slot for moving the fixture,
6 wherein the rod is connected to the cam at one end, and abuts
7 the fixture at the other end, wherein the rod moves the fixture
8 by the rotation of the cam.

1 10. The apparatus as claimed in claim 3, further
2 comprising:

3 a step motor, electrically connected to the conveying
4 device, for moving the conveying device the predetermined
5 distance; and

6 at least one sensor, for detecting the position of the
7 substrate, electrically connected to the step motor, whereby
8 the movement of the substrate, moving along with the conveying
9 device, depends on the detection of the sensor.

1 11. The apparatus as claimed in claim 10, wherein the
2 conveying device comprises:

3 a conveying belt for receiving and supporting the
4 substrate thereupon; and

5 two rollers, electrically connected to the step motor,
6 for moving the conveying belt.

1 12. The apparatus as claimed in claim 11, wherein the
2 dispensers are divided into plural groups at the
3 predetermined distance in the first axis, and each group of
4 the dispensers moves in a second axis perpendicular to the
5 first axis.

1 13. The apparatus as claimed in claim 10, wherein the
2 conveying device comprises:

3 a rotor electrically connected to the step motor; and
4 a platform, disposed on the rotor, for the substrate
5 disposing thereupon.

1 14. The apparatus as claimed in claim 13, wherein the
2 platform is circular shape, and the dispensers are disposed
3 in a ring.

1 15. A method for manufacturing at least one biochip from
2 at least one substrate comprising the steps of:

3 receiving the substrate on a conveying device;
4 conveying the substrate through a series of receiving
5 positions corresponding to a series of dispensing positions;
6 and

7 dispensing a series of arrays of reagents onto the
8 substrate at each dispensing position.

1 16. The method as claimed in claim 15, wherein the series
2 of receiving positions are linearly arranged.

1 17. The method as claimed in claim 15, wherein the series
2 of receiving positions are arranged in a ring.

1 18. The method as claimed in claim 15, wherein the series
2 of arrays is non-overlapping.

1 19. The method as claimed in claim 15, wherein a
2 plurality of substrates are received onto the conveying
3 device simultaneously, each of the plurality of substrates
4 being conveyed through the series of receiving positions is
5 a step-by-step manner.

1 20. A method for manufacturing at least one biochip from
2 at least one substrate comprising the steps of:
3 receiving the substrate on a conveying device;
4 conveying the substrate through a series of receiving
5 positions corresponding to a series of forming positions; and
6 forming a series of arrays of reagents onto the substrate
7 at each forming position.

1 21. The method as claimed in claim 20, wherein the series
2 of receiving positions are linearly arranged.

1 22. The method as claimed in claim 20, wherein the series
2 of receiving positions are arranged in a ring.

1 23. The method as claimed in claim 20, wherein the series
2 of arrays is non-overlapping.

1 24. The method as claimed in claim 20, wherein a
2 plurality of substrates are received onto the conveying
3 device simultaneously, each of the plurality of substrates
4 being conveyed through the series of receiving positions is
5 a step-by-step manner.